Ultrasonic Additive Manufacturing of a deep throttling methane injector., Phase I

Completed Technology Project (2018 - 2019)

Project Introduction

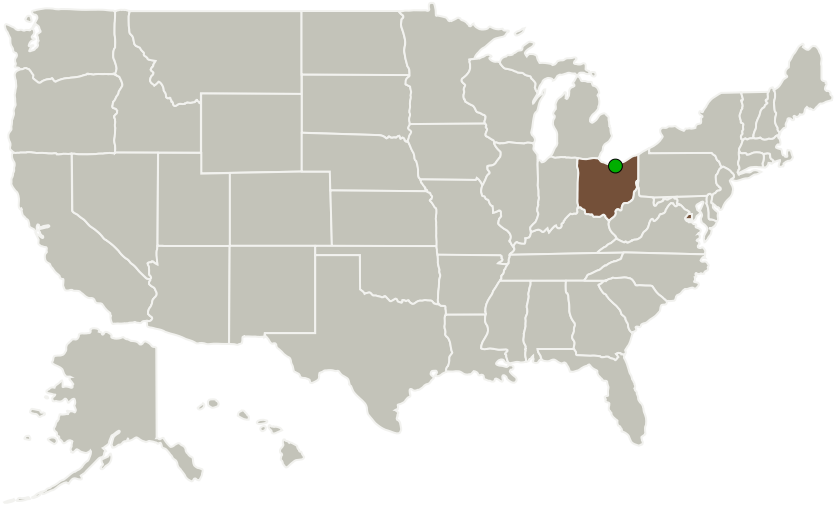
Design and manufacture of a Liquid fuel injector optimized for Ultrasonic Additive Manufacturing. UAM delivers aerospace parts today at 97% of bulk material property and foil laydown rates at speeds significantly better then powder or filament process. UAM has traditionally been applied to 2-D planar surfaces. We will extend UAM into complex geometries and constructs suitable for rocket engine injectors.

Anticipated Benefits

Combustion research, low cost engines, low cost exploration programs.

Military field manufacturing, Civil manufacturing.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
TGV Rockets, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Washington, District of Columbia
Edison Welding Institute	Supporting Organization	Academia	Columbus, Ohio
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
District of Columbia	Ohio

Project Transitions

July 2018: Project Start

August 2019: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140119)*

Images

Briefing Chart Image
Ultrasonic Additive Manufacturing of a deep throttling methane injector., Phase I
(https://techport.nasa.gov/image/131573)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TGV Rockets, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

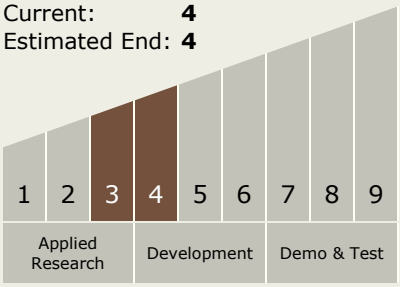
Carlos Torrez

Principal Investigator:

Derek Lang

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Final Summary Chart Image
Ultrasonic Additive Manufacturing of a deep throttling methane injector., Phase I
(https://techport.nasa.gov/image/134912)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.3 Cryogenic

Target Destination

Earth